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west of the 105th degree of west longitude, and south of the 40th parallel.—In the *Botanical Gazette* for July, Mary C. Reynolds notices at length certain Floridian ferns. E. T. Smith notices a new form of *Trillium grandiflorum* from Michigan. A writer over the initials C. R. B. calls attention to the neglected botany of West Virginia.—Fritz Müller questions, in *Nature*, whether many of the varieties of bananas have not been produced by bud-variation.—In the *Mittheilungen* of the Natural History Society of Bern, Herr Frankhauser contributes a paper on the most important conditions of shape in the leaf of phanerogamic plants, and a second one on the principal laws of growth in Florideæ, and Dr. Pertz notices some luminous bacteria.—In an important memoir on the ovule of plants, Prof. Warming discusses the early development of the leaf or “ovular mamelon,” the genesis of the nucleus and the formation of the integuments of the mamelon. According to a reviewer in *Nature* he demonstrates that the theory of Brogniart as to the morphological significance of the ovule is the true and solely admissible one, and he reasons very conclusively against the views of Bronn, Eichler and Strasburger, who would regard the ovule as a bud, while in reality, as he says, “the ovule is the homologue of a sporangium.”—Mr. L. Lesquereux contributes an article on Cordaites bearing fruit (with a plate) to the Proceedings of the American Philosophical Society.

ZOOLOGY.¹

DOES THE FOX SNAKE “MIMIC” THE RATTLESNAKE?—On May 24th a fact came under my observation which until then was unknown to me; it may, however, not be new to other readers of the *NATURALIST*.

While examining an exposure of lower magnesian limestone in the glen at the Junction mill, my attention was called to a large spotted snake lying upon the stump of a fallen tree, where it was stretched at full length basking in the sun over the stream. Before I could reach the spot the snake had apparently suspected danger and had retreated to a clump of grass near the foot of a tree where, by diligent search, it was at last discovered. Desiring to obtain the specimen alive, if possible, I placed my foot upon the body of the snake near the middle, when, to my surprise, there followed a buzzing sound that caused me to spring backward, thinking I had encountered a rattlesnake.

A blow from a stick disabled the snake but did not stop the buzzing sound, which was repeated several times, and the motion of the tail was distinctly observed by myself and my friend, Mr. F. F. Watson. The terminal inch and a half of the tail alone participated in the vibration, and was thrown rapidly from side to

¹The departments of Ornithology and Mammalogy are conducted by Dr. ELLIOTT COUES, U. S. A.

side over an arc of about three-fourths of an inch, moving so rapidly as to appear like a dull fan-like glimmer. In every instance observed the tail was raised but little above the horizontal, and the buzzing sound was continuous through a few seconds only.

Is this to be called an example of "mimicry"? May it be said that far back in the past some sagacious ancestor witnessing that act of intimidation on the part of the rattlesnake, and observing how successful it was, resolved to adopt the practice itself; and thus, through inheritance, the practice became engrafted upon this species? If so, that ancestor, it would seem, must have possessed a keenness of perception, an accuracy of judgment and a depth of reasoning human-like in a high degree, and far above what is usually recognized among the members of its class.

If the fact under consideration is not an example of "mimicry," may it be said that some ancestor in one of its battles accidentally moved its tail from side to side so rapidly as to produce a strange buzzing sound that frightened its antagonist away; that that snake possessed the sagacity to connect the flight of its enemy and the buzzing sound with the rapid motions of its tail; and that by continued repetition of this feat in subsequent battles, there were wrought structural and mental changes sufficiently fixed to be inherited?

If all this be granted, and it is very unsatisfactory reasoning to me, we have possibly a clew to the beginning of differentiation in the tail of the rattlesnake.

There can be but little doubt but that the specimen under consideration is the fox snake, *Coluber vulpinus*, although I have at hand only the abbreviated description found in Jordan's "Manual of Vertebrate Animals."—*F. H. King, River Falls, Wis., May 26, 1879.*

BREEDING OF LAND-LOCKED SALMON.—Land-locked salmon, in the Schoodic waters (Maine) are occasionally found filled with ripe spawn in the spring. This seems a curious circumstance in fish which normally spawn in the autumn months, and perhaps may be considered a case of retarded development. In our own experience we have never seen melt in the male fish at this out-of-season, and it would seem as if it but needed the concurrence of retardation in the two sexes, and their coming together, in order to change the breeding habits of the species. What is curious, if a general fact, the instinct of propagation in these untimely fish seems inferior to that instinct which governs their habits of life. Normally, during the breeding season, these salmon seek the rapid streams, but these spring fish, filled with spawn, are found in the waters of the lake along with others of their species. In order to give directness to this statement we would state that, for one instance, on June 2d we took from the

lake a large healthy fish which extruded into the boat apparently healthy eggs as large as peas, and more were afterwards forced out in abundance by gentle pressure. In the young fry from last year's hatching, the yolk sac was scarcely absorbed at this time.—*E. Lewis Sturtevant, M. D., S. Framingham, Mass.*

NOTES ON AMERICAN CRUSTACEA.—Having recently been studying the Crustaceans belonging to Union College, kindly loaned me by Prof. H. E. Webster, I have thought best to place on record some of the more noticeable features of the collections. I hope, however, at an early day to publish a more extended notice. Enough specimens were found to show the identity of *Othonia anisodon* with *O. aculiata* (Gibbes) Stm. A new species of *Actæa* (*A. spinifera*) occurred from Plantation Key, Fla. This species closely resembles *A. hirsutissima* (Rüppell) Dana, from the Indian ocean and the Red sea, and differs from all other American species in the character of the antero-lateral teeth, which closely resembles those of *A. hirsutissima*. Prof. Webster collected specimens of *Panopeus* of the two forms described as *sayi* and *texasus*, but I can find no constant character to separate them; the coloration of the hand and presence or absence of the sub-hepatic tubercle certainly are not sufficient characters. A comparison of the young of *Hepatus decorus* with *H. tuberculatus* Saussure, as suggested by Stimpson, reveals the fact that the two species are distinct. A new species of *Lithadia* (*L. lacunosa*), allied to *L. cariösa*, was found at Sarasota bay, Florida. It differs, however, from that species in the ornamentation of the carapace, which is covered with circular depressions like those on a lady's thimble. Among the Anomura were specimens from North Carolina and Florida of the curious *Euceramus prælongus* Stm., which resembles a *Hippa* in form, but is allied by its structure to the porcelain crabs. A new species of *Pisosoma* (*P. glabra*) comes from Key West. It differs from *P. riisei* in the simple not bimarginate front. *Polyonyx macrochelis* and *Lepidops venusta* were found at Fort Macon, N. C., adding two species to the fauna of that locality in addition to those mentioned in my list (Proceedings Philadelphia Academy, 1878, pp. 316-330). Among the Macrura the most noticeable was a species of *Ogyris* (*O. alphærostris*) from Northampton county, Virginia (Eastern shore, Atlantic side.) This species differs from the only other known one, *O. orientalis*, in having a rostrum like that of *Alphæus heterochelis*, and the absence of a dorsal carina on the carapace. The eyes are slender and elongate, strikingly like those of *Hippa*. A peculiar interest attaches to this and certain other genera of Crustacea (*Tozeuma*, *Urocaris*, *Rhynchocyclus* and *Limulus*) from the fact that the known species inhabit the eastern coasts of the two continents, while the western shores have no representatives of these genera. A similar fact in geographical distribution has been noticed in the flora. Specimens of *Alphæus minus*, from

Florida, were the largest I have ever seen, one measuring forty-five millemetres in length.—*J. S. Kingsley*.

THE BELOSTOMA PISCIVORUS.—Having some stickle-backs in a jar of water I was surprised at finding one or two of them dead, though hardy. Soon afterwards, however, I saw a large water-bug (*Belostoma*) seize one of these fish, pierce it with its strong beak, and apparently suck the fish's blood.—*Henry Turner, Ithaca, N. Y.*

EARLY STAGES OF THE OYSTER.—Certain of the early stages of the oyster have been studied in Europe, but a complete history is much needed. Prof. W. K. Brooks is now engaged on this subject at Crisfield, Maryland, where he has established the Summer Zoölogical Laboratory of the Johns Hopkins University in connection with the U. S. Fish Commission. He had succeeded May 20th in artificially fertilizing the eggs, ascertaining that the process of segmentation occupied two hours, and that in six hours free-swimming ciliated embryos are produced.

THE MAIOD CRABS.¹—Mr. Miers has given in this paper a revision of the families, sub-families and genera of this interesting group of Crustacea. The genera enumerated number 106, and are placed in four families, *Inachidæ*, *Maiidæ*, *Periceridæ* and *Parthenopidæ*, founded on characters derived from the orbits and antennæ. The families as given by Dana in the Crustacea of the U. S. Exploring Expedition, were shown several years ago to be faulty, and in the present state of our knowledge of this group, the arrangement proposed is generally good, and will prove indispensable to the student. The pages of the NATURALIST are not the place for an extended examination of this system of classification, but it may not be out of place to notice a few of the points, errors and omissions of the paper. The generic name *Podonema* is preoccupied (as *Podinema*) in the Reptilia, and I would here propose the name *Coryrhynchus* in allusion to the hood-shaped rostrum; it includes three species from Florida, *rüsei*, *hypoglypha* and *lamelligera*. The genus *Oncinopus* DeHaan, for which Dana established a separate group, is assigned to the neighborhood of *Irachus*. The placing of *Chorinus* and *Macrocheira* in the same section hardly seems proper, nor does the separation of *Schizophrys* and *Cyclax* from the neighborhood of *Mithrax* and *Mithraculus*. The placing of *Libinia* and *Cœlocerus* in different families is, we think, hardly right. A character separating *Mithrax* and *Mithraculus* which is not noticed in this paper is that in *Mithrax* the anterior margin of the meral joint of the external maxilliped is notched for the reception of the succeeding joints, while in *Mithraculus* it is entire. The generic

¹ On the Classification of the Maiod Crustacea. By EDWARD J. MIERS. (Journal of the Linnæan Society of London—Zoölogy. Vol. XIV, 1879.) Pages 634–673, pls. XII and XIII.

name *Microrhyncus* is preoccupied, and Alphonse Milne Edwards has proposed in its stead the name *Neorhyncus*.

THE ROCKY MOUNTAIN LOCUST IN NEW MEXICO.—During a recent trip to New Mexico to investigate the southern limits of the distribution of *Caloptenus spretus*, I was enabled to ascertain a number of new facts regarding the extreme southern limits of this species. According to Ex-governor W. F. Army, of Santa Fé, small swarms of destructive locusts, supposed to be this species, have appeared at a point 140 miles south of Santa Fé. Heretofore the U. S. Entomological Commission had been unable to trace it south of Taos, N. M., where it was known to have been destructive in 1877. From Ex-governor Army and several Mexicans and Pueblo Indians we obtained the following facts, which are of general interest. In 1868 the counties of Valentia and Bernalillo were troubled by locusts. They probably came from the north-west as they do generally, and without doubt breed in the eastern portions of Arizona lying west of Valentia county, N. M. In 1865 they were seen near Santa Fé, and the wheat crop of the Pueblo Indians of Pojuaque was totally destroyed by locusts which came from the north-west. In 1868 the same Pueblo was visited late in the season. In 1871 Santa Fé, and in 1874 Santa Fé and Rio Ariba counties, including several Pueblo Indian towns, were invaded. In 1873 Colfax county was visited, and a few appeared the next year. In 1877 Santa Fé and Taos counties were invaded. The swarms at Santa Fé came from the west or south-west, in July, and passed up into Rio Ariba and Taos counties, crossing into Costilla county, Colorado. From these facts it seems that the northern half of New Mexico, and probably Northern Arizona, are occasionally subject to invasions of locusts from Southern Colorado; but the flights are sporadic and local, and occur after the wheat crop has been mostly harvested. Whether on account of droughts or locusts, or from both causes, the Pueblo Indians have, like the Egyptians of old, been in the habit of laying up stores of wheat and corn two and three years in advance.—A. S. Packard, Jr.

ZOOLOGICAL NOTES.—We take the following notes from late numbers of *Nature*: Dr. Fritz Müller has sent from Brazil a trichopterous insect belonging to the *Leptoceridæ*, remarkable on account of its showing, very distinctly, branchia such as have lately been discovered in the imago state of this group by Dr. Palmén.—M. Jourdain has read a paper before the French Academy on the respiratory apparatus of *Ampullaria*, a fresh-water mollusk.—The muscles of crayfish have been studied from a physiological point of view by M. Richet, the muscles of the clam have a high degree of contractibility.—M. Sørensen, in his studies on the apparatus of sound in various South American fishes, finds that vibrations are communicated to the air of the

swimming bladder.—The fauna of the Solomon islands, has been discussed by Mr. E. P. Ramsay, several new birds being described; 120 mammals and about fifty species of insects were collected for the Australian Museum, of which Mr. Ramsay is the collector.—The fossil head of a *Rhinoceros tiorhinus* has been found in Siberia in a good state of preservation.—Another fossil mammoth has been found at Newburgh, N. Y.—The metamorphoses of the cantharides (*Lytta vesicatoria*) from the egg has been worked out by M. Lichtenstein, of Paris.—The body-cavity of sedentary Annelids has been studied by M. Cosmorigi, and the anatomy of an Actinia, *Cerianthus membranaceus*, has been investigated by Von Heider.—The genus *Squilla* is now known to date as far back as the London clay, and Mr. Woodward, the discoverer of the fact, describes *Necroscilla wilsoni*, a supposed stomapod Crustacean from the middle coal measures, and a fossil king crab (*Limulus*) from the cretaceous formation of the Lebanon.—Collections of birds have lately been examined by London ornithologists, from the Argentine Republic and the United States of Columbia, the latter collection comprising 3500 specimens, representing 469 species.—A collection of land shells, of which ten or twelve are supposed to be new, collected by the late Dr. W. M. Gabb, in Costa Rica, has been reported on by Mr. G. F. Angas.—A young hippopotamus has lately died in captivity of trichinosis.—Immense swarms of butterflies have been witnessed at Le Mail and in Alsace, June 8th and 10th, and June 7th in Zurich.

ANTHROPOLOGY.¹

ANTHROPOLOGICAL NEWS.—The first number of *Matériaux* for 1879 is one of unusual interest to the general reader. On page 22 is a report of a discussion before the Geological Society of London, on the mammoth in space and time. On page 31 is given a series of stone implements from Japan. On page 33 M. Maret presents the results of diggings in the grotto of Placard, Charent. Figure 18 represents a crescent-shaped implement from the horn of the reindeer, use undetermined. We beg to suggest that the object is drawn upside down, and that it resembles very closely the bone deadeyes used on Eskimo Kyaks for running lines; in other words it is the parent of our modern block for tackle. On page 46 we have the announcement of the meeting of the Congrès international d'Anthropologie et d'Archeologie préhistorique at Lisbon, in 1880, and the programme of M. Daly's Course of Ethnology for 1880, at the School of Anthropology in Paris, as follows:

1. Les sciences anthropologiques. Définitions. L'ethnologie et l'ethnographie. Eléments statiques et dynamiques.

Sources de l'ethnologie. Anatomie et physiologie individuelle

¹ Edited by Prof. OTIS T. MASON, Columbian College, Washington, D. C.